



Electronic Embroidery

Written By: Becky Stern



TOOLS:

- [Drill \(1\)](#)
- [Embroidery hoop \(1\)](#)
- [Needlenose pliers \(1\)](#)
- [Pen \(1\)](#)
or pencil
- [Scissors \(1\)](#)
- [Soldering iron \(1\)](#)



PARTS:

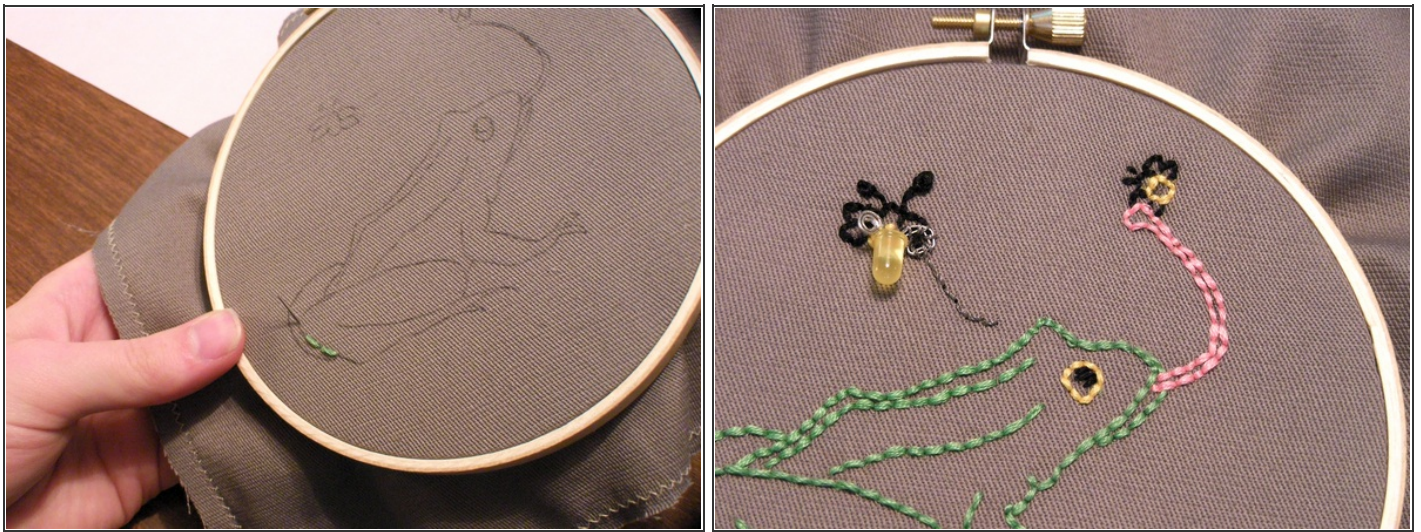
- [Pattern \(1\)](#)
Download from
craftzine.com/09/light_embroidery
- [Carbon paper \(1\)](#)
- [Fabric \(1\)](#)
- [Sternlab LED Sewing Kit \(1\)](#)
- [LED \(2\)](#)
- [On/off switch \(1\)](#)
- [Coin cell battery \(1\)](#)
- [Battery holder \(1\)](#)
- [Conductive thread \(1\)](#)
- [Embroidery needle \(1\)](#)
and floss in yellow, green, pink, and
black
- [Thread \(1\)](#)
any color

SUMMARY

I love any activity that promotes creativity and discovery. To me, tinkering with electronics is the same as stitching a picture, and combined they can tell a story that crafters and gearheads both want to hear. This picture of a frog catching fireflies is embellished with lights that bring the bugs to life. Conductive thread is the magic ingredient, bridging the gap between rigid metal and soft floss. To make a stitched scene light up, combine traditional embroidery techniques with a few common electronics components. The possibilities are endless, and the result is an artful conversation piece.

This project has an associated [CRAFT Video](#).

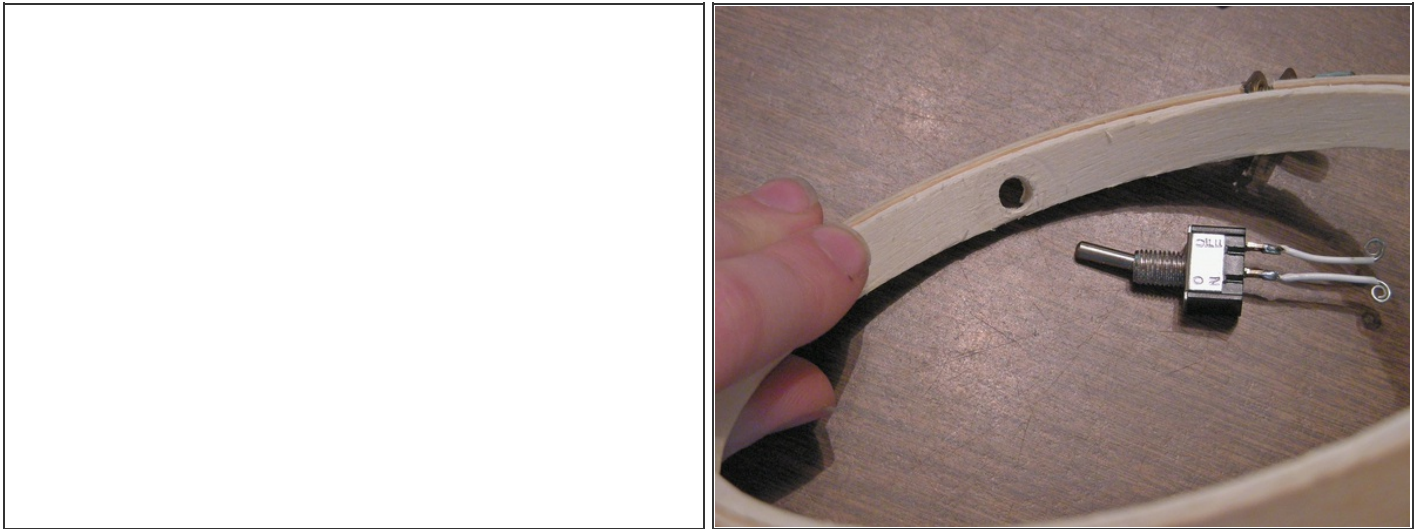
Step 1 — Embroider the scene.



- This project starts like any other embroidery: trace the pattern onto the fabric with carbon paper, then pull the fabric taut in the hoop with the design centered.
- Backstitch along the lines of the pattern until it's complete.
- For more instruction on how to embroider, see 101: Embroidery in CRAFT, Volume 06.



Step 2 — Prepare the switch and LEDs for sewing.



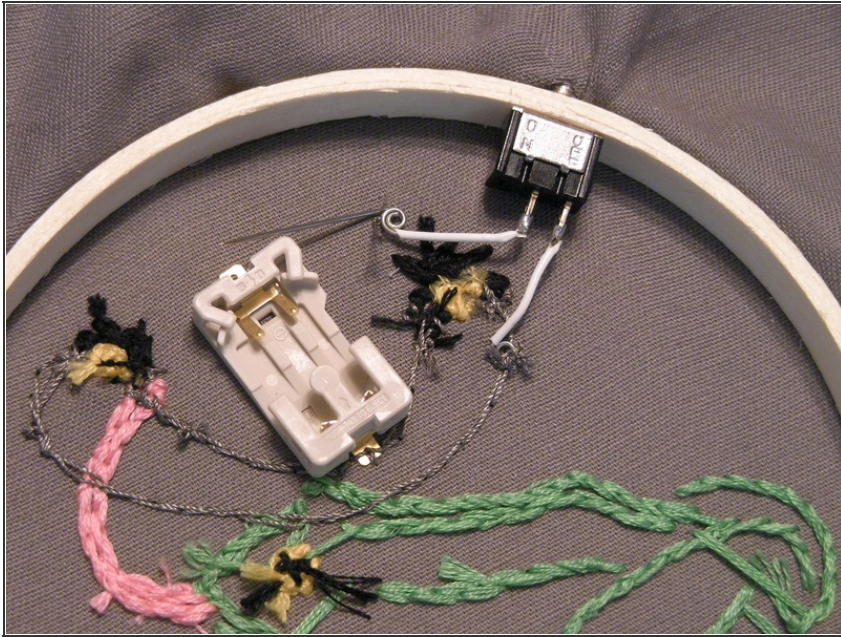
- To prep the LEDs, use pliers to bend the longer (positive) lead in a square spiral, coiling it toward the lens (the part that lights up). Coil the shorter (negative) lead in a circular spiral up toward the lens. Repeat with the other LED.
- Prepare the switch by soldering 1 wire to each switch terminal and then coiling the ends of both wires. If you don't have a soldering iron, you can just sew straight through the switch terminal leads when it comes time to connect the switch.
- Next, remove the stitched design from the hoop and drill a hole through both rings of the hoop wherever you'd like the switch to be.

Step 3 — Sew the circuit.



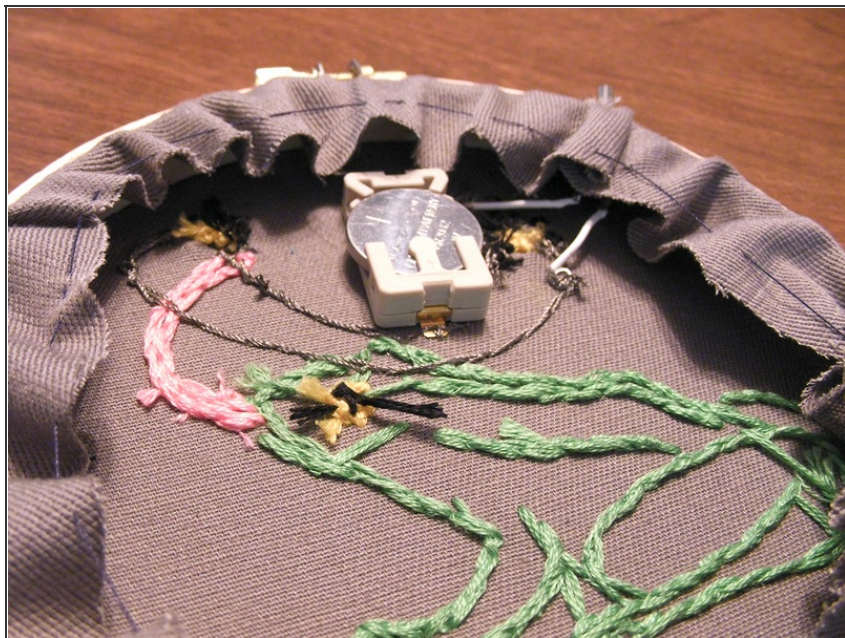
- Thread your needle with conductive thread. Hold the LED in place with one hand. Stitch over and around the square-coiled lead many times to make a strong mechanical and electrical connection.
- Following the wiring diagram, backstitch a line to the positive battery connector. Hold the battery holder in place with one hand, and sew its positive (+) terminal in place with the other. Stitch it as you did the LED, with many stitches through the terminal's hole.
- Without cutting the thread, backstitch a path to the other firefly LED, and sew its square-coiled lead as you did the first. Tie off the thread and weave it back along the stitched line, then cut it. This helps prevent short circuits from fraying ends.
- Sew the circular, negative leads of the LEDs together. Be sure not to cross the positive trace.

Step 4 — Install the switch.



- Center the design in the embroidery hoop, with the 2 holes aligned and the fastening hardware at the top (a little wiggling may be required).
- Directly over the holes, poke a hole in the fabric with scissors or an awl or seam ripper. From inside the hoop, push the threaded post of the switch through the hole with a few turns of the wrist, then secure it on the outside with its nut.
- Sew 1 lead of the switch to the negative conductive path (the path not attached to the battery), with many stitches for a good connection.
- Cut the thread. Backstitch a line from the other switch lead to the negative (–) battery connector terminal and sew through the hole in the terminal. Cut the thread.

Step 5 — Let it glow.



- Check your circuit against the diagram and watch out for fraying thread shorts. Set the switch to the Off position. Insert the battery in the holder, with its + side facing up. Turn the whole thing over and flip the switch. You should see the light! If you don't, turn it off and check for good connections and shorts.
- Trim the fabric within 1 1/2" of the edge. Use regular thread and a running stitch to gather the edge on the backside. Now hang it and enjoy!

This project first appeared in [CRAFT Volume 09](#).

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